

WHAT IS CLAIMED IS:

1. A filter element, comprising:
a filtration media;
an upstream filtration media support positioned upstream from and in contact
5 with said filtration media; and
a multi-layer downstream filtration media support positioned downstream from
said filtration media, said multi-layer downstream support including a first downstream
support layer and a second downstream support layer, wherein:
 - 10 (a) said first downstream support layer is in contact with said filtration
media and is interposed between said filtration media and said second
downstream layer, said first downstream support layer is fabricated so as
to minimize points of surface contact with said filtration media; and
 - (b) said second downstream support layer is in contact with said first
15 downstream support layer and is fabricated so as to facilitate lateral fluid
flow relative to said multi-layer downstream pleat support.
2. A filter element as recited in Claim 1, wherein the filtration media is a
pleated filtration media having a plurality of longitudinally extending pleats.
3. A filter element as recited in Claim 2, wherein the longitudinally
extending pleats of said pleated filtration media are selected from the group consisting
20 of radial pleats, w-pleats and spiral pleats.
4. A filter element as recited in Claim 1, wherein the filtration media is a
microporous filtration membrane having a pore size of from about 0.1 microns to about
10 microns.
5. A filter element as recited in Claim 1, wherein the filtration media is
25 fabricated from a material selected from the group consisting of Teflon, nylon,
polyaramide, polyvinylidene difluoride, polyether sulfone and combinations thereof.

6. A filter element as recited in Claim 1, wherein the multi-layer downstream support consists of said first downstream support layer and said second downstream support layer.

7. A filter element as recited in Claim 1, wherein said first downstream
5 support layer is fabricated from a nonwoven material.

8. A filter element as recited in Claim 7, wherein said nonwoven material is laminated to said filtration media.

9. A filter element as recited in Claim 7, wherein said nonwoven material is fabricated as a spunbond, spunlace, airlaid or wetlaid material.

10. A filter element as recited in Claim 7, wherein said nonwoven material
10 is fabricated from polypropylene, polyester or polyamide.

11. A filter as recited in Claim 1, wherein said second downstream support layer is an extruded apertured element.

12. A filter element, comprising:
15 a filtration media;
an upstream pleat support positioned upstream from and in contact with said filtration media; and

a multi-layer downstream pleat support positioned downstream from said filtration media, said multi-layer downstream support including a first downstream
20 support layer and a second downstream support layer, wherein:

(a) said first downstream support layer is in contact with said filtration media and is interposed between said filtration media and said second downstream layer, said first downstream support layer is fabricated so as to minimize points of surface contact with said filtration media; and

- (b) said second downstream support layer is in contact with said first downstream support layer and is fabricated so as to facilitate lateral fluid flow relative to said multi-layer downstream pleat support.

13. A filter cartridge comprising:

5 a filter element having a longitudinal axis, an outer periphery and an inner periphery, and including a filtration media; an upstream filter media support positioned upstream from and in contact with said filtration media; and a multi-layer downstream support positioned downstream from said filtration media, said multi-layer downstream support including a first downstream support layer and a second downstream support
10 layer, wherein:

- (a) the first downstream support layer is in contact with said filtration media and is interposed between said filtration media and said second downstream layer, said first downstream support layer being fabricated so as to minimize points of surface contact with said filtration media;
15 and

- (b) the second downstream support layer is in contact with said first downstream support layer and is fabricated so as to facilitate lateral fluid flow relative to said multi-layer downstream filter media support;

a perforated cage surrounding the outer periphery of the filter element;

20 a perforated core surrounded by the inner periphery of the filter element; and
end caps enclosing both ends of the perforated cage.

14. A filter cartridge as recited in Claim 13, wherein said first downstream support layer is fabricated from a nonwoven material.

15. A filter cartridge as recited in Claim 14, wherein said nonwoven
25 material is laminated to said filtration media.

16. A filter element as recited in Claim 14, wherein said nonwoven material is fabricated as a spunbond, spunlace, airlaid or wetlaid material.

17. A filter element as recited in Claim 14, wherein said nonwoven material is fabricated from polypropylene, polyester or polyamide.

5 18. A filter element as recited in Claim 1, wherein said second downstream support layer is an extruded apertured element.

19. A filter element as recited in Claim 1, wherein said second downstream support layer is an extruded apertured element having ribs formed on one side.

10 20. A filter cartridge as recited in Claim 13 wherein the perforated cage is equipped with end caps at both ends thereof.

21. A filter cartridge as recited in Claim 13 wherein said perforated core is a cylindrical core and is coaxially positioned within the filter element which is a cylindrical filter element and the cage is likewise cylindrical and is coaxially positioned about the cylindrical filter element.

15 22. A filter cartridge comprising:
a filter element having a longitudinal axis, an outer periphery and an inner periphery, and including a filtration media; and a multi-layer downstream pleat support positioned downstream from said filtration media, said multi-layer downstream support including a first downstream support layer and a second downstream support layer,
20 wherein:

(a) the first downstream support layer is in contact with said filtration media and is interposed between said filtration media and said second downstream layer, said first downstream support layer being fabricated so as to minimize points of surface contact with said filtration media;
25 and

- (b) the second downstream support layer is in contact with said first downstream support layer and is fabricated so as to facilitate lateral fluid flow relative to said multi-layer downstream pleat support;
- a perforated cage surrounding the outer periphery of the filter element;
- 5 a perforated core surrounded by the inner periphery of the filter element; and
- end caps enclosing both ends of the perforated cage.